

SE (III) (IT) (choice based)

(3 Hours)

(Total Marks : 80)

Please check whether you have the right question paper.

- N.B.:**
- 1) Questions No. 1 is compulsory.
 - 2) Solve **any three** question out of remaining five questions.
 - 3) Assume suitable **data** if necessary.
 - 4) **Figures** to the right indicate **full marks**.

1 Solve any **four** out of five :

(20)

- a) Why biasing is necessary in BJT amplifier?
- b) Solve $(35)_{10} - (47)_{10}$ using two's complement method.
- c) Define :
 - i) truth table
 - ii) standard SOP
 - iii) De-Morgan's theorem
 - iv) Duality theorem
 - v) universal gate
- d) Define multiplexer and state its application.
- e) Convert S-R flip-flop to T flip-flop.

2. a) Using Quine-Me-dusky method determine minimum SOP form for

(10)

$$f(A, B, C, D) = \sum m(0, 1, 3, 7, 8, 9, 11, 15)$$

b) What do you mean by differential amplifier? What is its primary function? State different configurations of it, which one is popularly used.

(10)

3. a) Draw & explain Ring counter using suitable waveforms.

(10)

b) Implement the following using only one 4:1 MUX and few gates :

(10)

$$f(A, B, C, D) = \sum m(0, 1, 3, 4, 5, 7, 9, 10, 12, 15)$$

4. a) Design MOD-9 Synchronous counter using J-K flip-flop.

(10)

b) Design four bit BCD adder using IC7483.

(10)

5. a) What is shift register? Mention different modes of operation of shift register?

(10)

b) State and explain various VHDL data objects in brief.

(10)

6. Solve the following (**Any Four**) :

(20)

- a) VHDL program format.
- b) Difference between combinational circuit and sequential circuits.
- c) Different biasing methods.
- d) Race-around condition in flip-flop.
- e) Current mirror circuit.
- f) Arithmetic logic unit.